What is claimed is:

1. An apparatus for analysis of reagent mixtures having a plurality of reagent-mixture components, comprising:

means for pumping a plurality of reagent-mixture components;

means for introducing at least one reagent-mixture component into a stream of at least one other reagent-mixture component to mix the plurality of reagent-mixture components and create a reagent mixture; and

means for analyzing the reagent mixture.

2. An apparatus as defined in claim 1, further comprising means for adjusting the mixture ratio of the reagent mixture by adjusting the flow rate of at least one reagent-mixture component.

3. An apparatus as defined in claim 2, wherein the means for pumping includes a plurality of pumps, each pumping a respective reagent-mixture component, and the means for adjusting the mixture ratio is coupled to and controls the flow rate of each pump to in turn control the flow-rate ratio of the reagent-mixture components.

4. An apparatus as defined in claim 3, further comprising a plurality of pump motors, each pump motor being coupled to a respective pump to control the flow rate of the pump and a respective reagent-mixture component.

5. An apparatus as defined in claim 1, further comprising a control unit coupled to the means for pumping and including a database of predetermined reagent-mixture ratios, wherein each predetermined reagent-mixture ratio corresponds to one or more animal species, and the control unit is responsive to an input for a selected animal species to control the means for pumping to pump the reagent-mixture components of the respective reagent-mixture ratio of the selected animal species at a flow-rate ratio corresponding to the reagent-mixture ratio.

6. An apparatus as defined in claim 1, further comprising a plurality of reagent-mixture component chambers, wherein each reagent-mixture component chamber contains a respective reagent-mixture component and is coupled in fluid communication with the means for pumping for supplying reagent-mixture components to the means for pumping.

7. An apparatus as defined in claim 1, wherein the means for introducing includes a first fluid line for carrying at least one reagent-mixture component, a second fluid line for carrying at least one other reagent-mixture component, a mixing chamber coupled in fluid communication with the first and second fluid lines for receiving and mixing the plurality of reagent-mixture components and creating the reagent mixture, and an outlet port coupled in fluid communication with the mixing chamber downstream of the first and second fluid lines for receiving the reagent mixture.

8. An apparatus as defined in claim 7, wherein the mixing chamber is defined by an upstream end, a downstream end, and at least one axially-elongated surface extending between the upstream and downstream ends, and the outlet port is coupled in fluid communication with the downstream end of the mixing chamber.

9. An apparatus as defined in claim 8, wherein the second fluid line is coupled in fluid communication with the mixing chamber for introducing the respective reagent-mixture component at an angle of less than 180° with respect to the reagent-mixture component introduced by the first fluid line.

10. An apparatus as defined in claim 9, wherein the first fluid line is coupled in fluid communication with the upstream end of the mixing chamber for introducing the respective reagent-mixture component on a flow path substantially aligned with the axis of the mixing chamber.

11. An apparatus as defined in claim 7, comprising a plurality of fluid lines, each fluid line being coupled in fluid communication with the mixing chamber either upstream or downstream of an adjacent fluid line.

12. An apparatus as defined in claim 11, wherein each fluid line is coupled in fluid communication with the mixing

chamber at a location spaced radially with respect to an adjacent fluid line.

13. An apparatus as defined in claim 7, wherein the mixing chamber is defined by a plurality of raised surface portions spaced relative to each other for creating turbulence within the mixing chamber to facilitate mixing of the reagent-mixture components.

14. An apparatus as defined in claim 13, wherein the mixing chamber is defined by an upstream end, a downstream end, and at least one axially-elongated surface extending between the upstream and downstream ends, and the raised surface portions are defined by a plurality of protuberances projecting inwardly from the axially-elongated surface toward approximately the center of the chamber.

15. An apparatus as defined in claim 14, wherein the protuberances are at least one of (i) axially spaced relative to each other and (ii) radially spaced relative to each other.

16. An apparatus as defined in claim 13, wherein the raised surface portions are defined by a plurality of baffles, each baffle projecting inwardly generally toward the center of the mixing chamber.

17. An apparatus as defined in claim 16, wherein each baffle defines a plurality of apertures for receiving fluid flow therethrough.

18. An apparatus as defined in claim 16, wherein each baffle also projects generally toward the upstream end of the mixing chamber.

19. An apparatus as defined in claim 1, wherein the means for introducing includes at least one inlet port coupled in fluid communication with the means for pumping for receiving reagent-mixture components, at least one outlet port located downstream of the at least one inlet port, and a mixing chamber extending between the at least one inlet and outlet ports, wherein the mixing chamber is defined by at least two diffusion chambers and a relatively constricted aperture extending between the diffusion chambers.

20. An apparatus as defined in claim 19, wherein each diffusion chamber is defined by a radial surface.

21. An apparatus as defined in claim 20, wherein the radial surface is substantially spherical.

22. An apparatus as defined in claim 7, further comprising a plurality of tubes, each tube being coupled on one end to a respective fluid line and projecting on the other end

into the mixing chamber for introducing a respective reagent-mixture component into the mixing chamber.

23. An apparatus as defined in claim 22, wherein each tube defines a plurality of apertures on its end portion projecting into the mixing chamber for introducing the respective reagent-mixture component through the apertures and into the mixing chamber.

24. An apparatus as defined in claim 22, wherein the end portion of each tube projecting into the mixing chamber is oriented substantially toward an upstream direction.

25. An apparatus as defined in claim 22, wherein the tubes are at least one of (i) axially spaced relative to each other and (ii) radially spaced relative to each other.

26. An apparatus as defined in claim 7, wherein the mixing chamber is defined by an axially-elongated surface, and each fluid line is coupled in fluid communication with the mixing chamber for introducing the respective reagent-mixture component at an angle of less than 180° with respect to the mixing chamber axis.

27. An apparatus as defined in claim 26, wherein each tube is oriented for introducing the respective reagent-mixture component toward a substantially upstream direction.

28. An apparatus as defined in claim 7, wherein the mixing chamber defines a diffusion portion and at least one mixing ball received within the diffusion portion for facilitating mixture of the reagent-mixture components.

29. An apparatus as defined in claim 28, wherein the mixing chamber further defines an axially-elongated portion coupled in fluid communication with the diffusion portion.

30. An apparatus as defined in claim 28, further comprising means for retaining the mixing ball within the diffusion portion while permitting fluid flow through the diffusion portion.

31. A method for analysis of reagent mixtures having a plurality of reagent-mixture components, comprising the steps of:

pumping a plurality of reagent-mixture components;

introducing at least one reagent-mixture component into a stream of at least one other reagent-mixture component to mix the plurality of reagent-mixture components and create a reagent mixture; and

analyzing the components of the reagent mixture.

32. A method as defined in claim 31, further comprising the step of adjusting the flow rate of at least one reagent-mixture component to adjust the mixture ratio of the reagent mixture.

33. A method as defined in claim 32, wherein the flow-rate ratio of the reagent-mixture components is substantially equal to the mixture ratio of the reagent mixture.

34. A method as defined in claim 31, further comprising the steps of creating a database of predetermined reagent-mixture ratios wherein each reagent-mixture ratio corresponds to one or more species, and creating a reagent mixture for a selected species by pumping the reagent-mixture components of the respective reagent-mixture ratio for the selected species at a flow-rate ratio corresponding to the reagent-mixture ratio.

35. A method as defined in claim 34, wherein the flow-rate ratio is substantially equal to the respective reagent-mixture ratio for the selected species.

36. A method as defined in claim 31, further comprising the step of directing the plurality of reagent-mixture components through a tortuous path to facilitate mixing the reagent-mixture components into the reagent mixture.

37. A method as defined in claim 31, further comprising the step of accelerating and decelerating the flow rate of the reagent-mixture components to facilitate mixing the reagent-mixture components into the reagent mixture.

38. A method as defined in claim 31, further comprising the step of directing the reagent-mixture components through a flow path defined by relatively expanded and relatively constricted portions to facilitate mixing the reagent-mixture components into the reagent mixture.

39. A method as defined in claim 31 for hematology testing and analyzing particle distributions within the reagent mixtures for blood cell analysis, wherein the reagent-mixture components are selected from the group including (i) a whole blood sample of a selected species, (ii) diluent, and (iii) a lysing agent, to make a blood/diluent/lyse reagent mixture corresponding to the selected species.